

CLAIMS

What is Claimed is:

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1. A stator plate for a stator segment assembly of a stator of an electric machine comprising:

an outer rim section that includes a radially inner surface;

5 a tooth section extending radially inwardly from said outer rim section; and

a first undercut portion formed in said radially inner surface of said outer rim section.

2. The stator plate of claim 1 wherein said first undercut portion is adjacent to said tooth section and wherein said outer rim section is generally perpendicular to said tooth section.

3. The stator plate of claim 1 wherein said first undercut portion increases slot area and allows additional winding wire around said first tooth section.

4. The stator plate of claim 1 wherein said first undercut portion provides clearance for a start turn of winding wire on said stator segment.

5. The stator plate of claim 1 wherein said first undercut portion is generally "U"-shaped.

6. The stator plate of claim 1 wherein said stator is formed by a plurality of stator plates.

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7. A stator segment assembly for a stator of an electric machine comprising:

a stator core including a stack of stator plates, each of said stator plates including an outer rim section, a tooth section extending radially inwardly from said outer rim section, a radially inner surface of said outer rim section that is generally perpendicular to said tooth section, and a first undercut portion formed in said radially inner surface of said outer rim section.

8. The stator segment assembly of claim 7 further comprising:

a first end cap attached to a face surface of said stack and having a radially outer section, a middle section extending radially inwardly from a center portion of said radially outer section, and an inner section connected to said middle section, wherein a radially inner surface of said outer section is generally perpendicular to sides of said middle section, and wherein said radially inner surface of said radially outer section includes a third undercut portion that is adjacent to said center portion of said radially outer section.

9. The stator segment assembly of claim 7 further comprising:

first and second end caps that are located adjacent opposite face surfaces of said stack, wherein said first and second end caps include third and fourth undercut portions that register with said first undercut portion of said stack.

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10. The stator segment assembly of claim 9 further comprising:
windings that are wound around said first and second end caps and
said stack.
11. The stator segment assembly of claim 10 further comprising:
an insulating material that is located between said windings and said
stack.
12. The stator segment assembly of claim 7 further comprising:
a tongue formed in one circumferential end of said outer rim section
and a groove formed in an opposite circumferential end of said outer rim section.
13. The stator segment assembly of claim 12 wherein said tongue and
said groove are "V"-shaped.
14. The stator segment assembly of claim 12 wherein said tongue and
said groove are "C"-shaped.
15. The stator segment assembly of claim 7 wherein said electric machine
is a brushless permanent magnet motor.
16. The stator segment assembly of claim 7 wherein said electric machine
is a switched reluctance motor.

17. The stator segment of claim 7 further comprising:
a second undercut portion in said radially inner surface of said outer
rim section.

18. The stator segment of claim 17 wherein said first undercut portion
provides sufficient clearance for a plurality of winding turns.

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19. A stator segment assembly for an electric machine comprising:

a stack of stator plates that are generally "T"-shaped and include an outer rim section, a tooth section that extends radially inwardly from a center portion of said outer rim section, a radially inner surface of said outer rim section that is generally perpendicular to said tooth section, and a first undercut portion in said radially inner surface of said outer rim section that is adjacent to said center portion and that is generally "U"-shaped.

20. The stator segment assembly of claim 19 further comprising:

an end cap that is generally "T"-shaped and includes an outer section, a middle section extending inwardly from a center portion of said outer section, and an inner section, wherein a radially inner surface of said outer section of said end cap is generally perpendicular to sides of said middle section, and wherein a second undercut portion is formed in said radially inner surface of said outer section and is adjacent to said center portion of said outer section.

21. The stator segment assembly of claim 19 further comprising:
first and second insulating end caps that are attached to opposite face
surfaces of said stack.

22. The stator segment assembly of claim 21 further comprising:
windings that are wound around said first and second end caps and
said stack; and
an insulating material that is located between said windings and said
5 stack.

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A method of winding a stator segment assembly of a stator of an electric machine comprising the steps of:

winding a start wire turn around a tooth section of a stator segment;

positioning a portion of said start wire turn in a first undercut portion of said

5 stator segment; and

winding additional turns around said tooth section.

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The method of claim 22 further comprising the step of:

positioning said start wire turn in a second undercut portion of said stator segment prior to winding said additional turns.

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The method of claim 22 further comprising the step of:

positioning said start wire turn in an elongate undercut portion of said stator segment.

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The method of claim 22 wherein said additional winding turns are wound using a computer numeric control (CNC) machine.

Rule 126

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